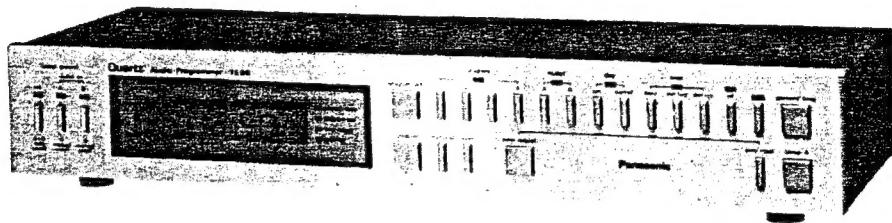


# Service Manual

Audio Programmer

TE 96



## Specifications

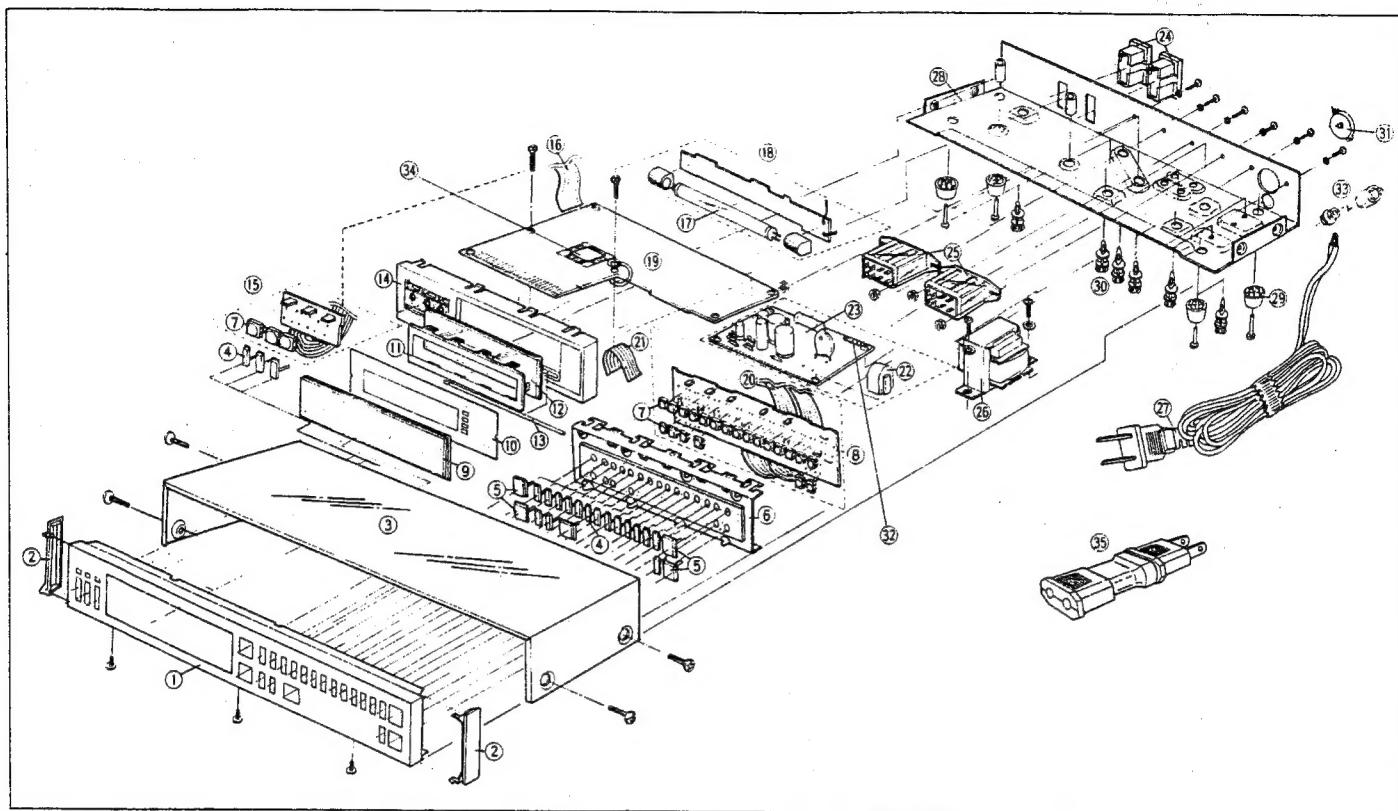
Power source:	220V AC 120/220/240V AC (PX only) 50~60Hz	Clock accuracy:	Quartz crystal controlled; within ±15 seconds per month
Rated current:	Outlet A & B 5A each	Timer accuracy	Within +0.02 seconds against preset program
Power consumption:	6W for operation of programmer	Power failure compensation time:	About 20 minutes
Power capacity:	1,100W (220V, 240V AC) 600W (120V AC)	Dimensions:	74 x 430 x 151 mm
Timer type:	1 week type (For each day, maximum of 8 operations, 4 cycles of ON/OFF)	Weight:	2,500 g



**Panasonic**<sup>®</sup>

Matsushita Electric Trading Co., Ltd.  
P.O. Box 288, Central Osaka Japan

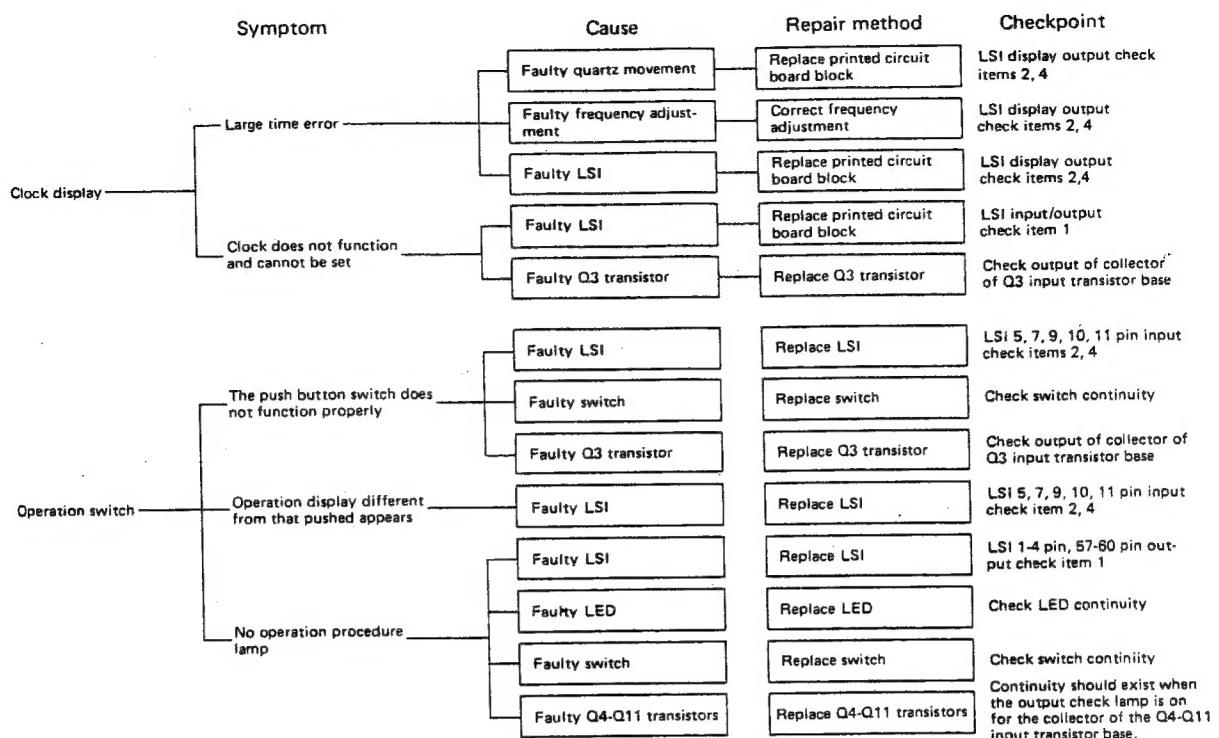
## EXPLODED VIEW



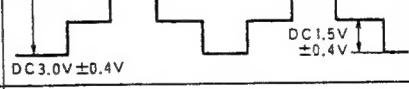
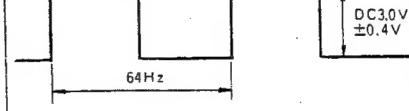
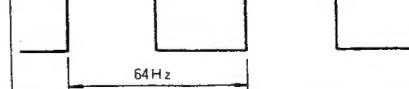
## REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Per set	Remarks
1	TE96003067I	Front panel (silver)	1	
	TE96002067I	" (black)	1	
	TE96003067II	" (silver) for PX	1	
2	TE96003167	Side panel for silver	2	
	TE96002167	" for black	2	
3	TE96003087	Upper case	1	
4	TE96013627	Key A (silver)	19	
	TE96012627	" (black)	19	
5	TE96023627	Key B (silver)	5	
	TE96022627	" (black)	5	
6	TE96003687	Key plate	1	
7	TE96002097	Switch	24	
8	TE960032107	Printed circuit board C	1	
9	TE96003107	Front cover	1	
10	TE96003377I	Display frame (gray)	1	
	TE96002377I	" (black)	1	
11	TE96000217	Display holder	1	
12	TE96002367	LCD	1	
13	TE96002657	Conductive rubber	1	
14	TE96003727	Fixed frame	1	
15	TE96042107	Printed circuit board D	1	
16	TE96023457	Block jammer B	1	
17	TE96002317	Cold minus polarity discharge tube	1	
18	TE96052107	Printed circuit board E	1	
19	TE96012107	" A	1	

Ref. No.	Part No.	Part Name & Description	Per set	Remarks
20	TE96013457	Block jammer A	2	
21	TE96033457	" C	1	
22	TE95002717	Line filter	1	TE95
23	TE96022107I	Printed circuit board B with fuse	1	
24	TE96002507	Receptacle A (A2)	2	
	TE96002507C	" C (C2, w/earth)	2	
25	TE96005337I	HP Relay	2	
26	TE96002237I	Power transformer	1	
27	TE96002057	Cord A (A2)	1	
	TE96002057C	Cord C (C2, w/earth)	1	
28	TE96003097A	Lower case A for PX	1	
	TE96003097C	" C (w/C2 hole)	1	
29	TE96007517	Foot	4	
30	TE96003997	PCB support	6	
31	TE90302017A	Voltage conversion switch (PX only)	1	TE95, 97, 903
32	TE96005267A	Fuse (160mA)	1	
33	TE96000357I	Bushing	1	EA-5
	TE96000357II	" for PX	1	EA-6
	TE96002101	Circuit block (=8) + (15) + (18) + (19) + (23)	1	
34	TE96002377	Micro computer	1	
35	TE96002217A	Adapter sets (PX only)	1	
36	TE96008107I	Operating instruction book	1	
37	TE96008007I	Individual box	1	



## INSPECTION METHOD

Symptom	Check item	Oscilloscope		Normal voltage and wave shape	Diagnosis and location of problem
		Probe	Ground lead		
Lights do not go on at all	1 VDD	(b)	(a)	DC 3.0V ±0.4V	No VDD voltage • Faulty transformer • Faulty ZD1 Zener diode
	Check common wave shape of display tube	(d)	(a)		No common wave shape • Faulty LSI
• Lights in a segment do not go on. • Lighted segment is faint. • Lighted segment flickers • All segments are lighted.	2 Check the LSI output wave shape	(c)	(a)		No LSI output when lights on • Faulty LSI LSI output exists when lights are on. • Faulty display tube
Discharge tube does not light up.	3 Check transformer output	(e)	(a)	AC 380V ±40V	No transformer output • Disconnected transformer wiring Transformer output exists • Faulty discharge tube
• Large time error • Clock does not function and cannot be set.	4 Check display output wave shape	(c)	(a)		No display output • Faulty LSI Display output exists • Faulty frequency adjustment Q3 transistor collector voltage is not at OV Faulty transistor
	Check Q3 transistor collector wave shape	(f)	(a)	0 V ————— VSS	
• Relay does not function at set time • Relay functions even when not set	5 Check LSI output	(g)	(a)	Relay when OFF VSS ————— VD Relay when ON VD ————— DC 3.0V ±0.4V VSS ————— VSS	When the wave shape shown does not appear • Faulty LSI • Faulty Q1, Q2 transistors

# TROUBLESHOOTING GUIDE

Symptom	Cause	Repair method	Checkpoint
Time display	Broken display tube	Replace display tube	Check display tube damage
	Disconnected transformer wire	Replace transformer	Check Sides 1 and 2 120/220/240V AC 5.5±0.5V AC
	Poor connection between display tube and printed circuit board	Reassemble display light section	Check connection status of pattern and display tube electrodes
	Faulty LSI	Replace printed circuit board block	Check LSI output
	Poor connection between display tube and printed circuit board	Reassemble display light section	Check connection status of pattern and display tube electrodes
	Faulty soldering of LSI	Correct soldering	Check soldering
	Faulty LSI	Replace printed circuit board block	Check connection status of pattern and display tube electrodes
	Faulty display tube	Replace display tube	Check LSI output
	Faulty LSI	Replace printed circuit board block	Check LSI output
	Faulty display tube	Replace display tube	Check LSI output
Timer	Poor connection between display tube and printed circuit board	Reassemble display light section	Check connection status of pattern and display tube electrodes
	Faulty LSI	Replace printed circuit board	Check LSI output
	Faulty display tube	Replace display tube	Check LSI output
	Poor connection between display tube and printed circuit board	Reassemble display light section	Check connection status of pattern and display tube electrodes
	Faulty LSI	Replace printed circuit board block	Check LSI output
	Faulty display tube	Replace display tube	Check LSI output
	Poor connection between display tube and printed circuit board	Reassemble display light section	Check connection status of pattern and display tube electrodes
	Faulty LSI	Replace printed circuit board block	Check LSI output
	Faulty display tube	Replace display tube	Check LSI output
	Discharge tube does not light up	Replace discharge tube	Check discharge tube voltage according to circuit check item 3
Relay	Disconnected transformer wire	Replace transformer	Check transformer side 2 according to circuit check item 3
	Faulty Q1, Q2 transistors	Replace Q1, Q2 transistors	Check output of collector of Q1, Q2 input transistor base
	Faulty LSI	Replace LSI	LSI 57, 58 pin output check item 5
	Faulty switch	Replace switch	Check switch continuity
	Faulty Q1, Q2 transistors	Replace Q1, Q2 transistors	Check output of collector of Q1, Q2 input transistors base
	Faulty LSI	Replace LSI	LSI 57, 58 pin output check item 5
	Faulty relay	Replace relay	If no continuity in relay coil, coil wiring disconnected
	Disconnected transformer wire	Replace transformer	Check transformer side 2 output
	Faulty switch	Replace switch	Check switch continuity
	Faulty LED	Replace LED	Check LED continuity
Outlet light	Faulty LSI	Replace LSI	LSI 57, 58 pin output check item 5

## CIRCUIT DIAGRAM

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